Cisco Catalyst 2960-SF Series Switches

The Cisco® Catalyst® 2960-SF Series of Fast Ethernet switches (Figure 1) provides enterprise-class Layer 2 switching for branch and midsized campus access applications. They enable reliable and secure business operations and lower total cost of ownership through a range of innovative features including FlexStack, Power over Ethernet Plus (PoE+), and Cisco Catalyst SmartOperations.

Cisco Catalyst 2960-SF LAN Base models feature:

- 2 or 4 Small Form-Factor Pluggable (SFP) uplinks for Gigabit performance and business continuity
- 24 or 48 Fast Ethernet ports
- Cisco FlexStack for simplified management with 20 Gbps of stack throughput, when deployed with the FlexStack stacking module
- IEEE 802.3at-compliant PoE+ for up to 30W of power per port
- Models offering 370W or 740W of combined POE/POE+ budget
- Enhanced troubleshooting for problem solving, including link connectivity and cable diagnostics
- USB storage for file transfers, backups, and simplified operations
- Support for Cisco Catalyst SmartOperations features including Smart Install and Auto Smartports
- Extended limited lifetime hardware warranty, including next-business-day replacement with 90-day service and support

Cisco Catalyst 2960-SF LAN Lite models feature:

- 2 SFP uplinks for Gigabit performance and business continuity
- 24 or 48 Fast Ethernet ports
- Enhanced troubleshooting for problem solving, including link connectivity and cable diagnostics
- USB storage for file transfers, backups, and simplified operations
- Support for Cisco Catalyst SmartOperations features, including Smart Install and Auto Smartports
- Extended limited lifetime hardware warranty

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Figure 1. Cisco Catalyst 2960-SF Series Switches

Switch Configurations

Table 1. Cisco Catalyst 2960-SF Series Switches with LAN Base Software

Switch Model	Description	Uplinks	Available PoE Power
Cisco Catalyst 2960S-F48FPS-L	48 Ethernet 10/100 ports with PoE+	4 SFP	740W
Cisco Catalyst 2960S-F48LPS-L	48 Ethernet 10/100 ports with PoE+	4 SFP	370W
Cisco Catalyst 2960S-F24PS-L	24 Ethernet 10/100 ports with PoE+	2 SFP	370W
Cisco Catalyst 2960S-F48TS-L	48 Ethernet 10/100 ports	4 SFP	-
Cisco Catalyst 2960S-F24TS-L	24 Ethernet 10/100 ports	2 SFP	-
Cisco Catalyst 2960S-F-STACK	Hot-swappable FlexStack stacking module for 2960-SF Series switches	-	-
LAN Base models support the optional Cisco FlexStack stacking module.			

Table 2. Cisco Catalyst 2960-SF Series Switches with LAN Lite Software

Switch Model	Description	Uplinks	Available PoE Power
Cisco Catalyst 2960S-F48TS-S	48 Ethernet 10/100 ports	2 SFP	-
Cisco Catalyst 2960S-F24TS-S	24 Ethernet 10/100 ports	2 SFP	-

Cisco FlexStack Stacking

Cisco FlexStack and IOS software provide true stacking, with all switches in a stack acting as a single switch unit. FlexStack provides a unified data plane, unified configuration, and single IP address for switch management. The advantages of true stacking include lower total cost of ownership through simplified management, and higher availability. FlexStack supports cross-stack features including EtherChannel, SPAN, and FlexLink.

The FlexStack stack module is hot-swappable and can be added to any Cisco Catalyst 2960-SF switch with LAN Base software, even while the switch is operating. Switches connected to a stack will upgrade to the correct Cisco IOS® Software version and transparently become a stack member. The FlexStack module also enables mixed stacking: 2960-SF series switches and 2960-S series switches can be combined in a single stack.

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Power over Ethernet Plus - PoE+

Cisco Catalyst 2960-SF switches support both IEEE 802.3af Power over Ethernet and IEEE 802.3at PoE+, which provides up to 30W of power per port. The Cisco Catalyst 2960-SF Series Switches lower total cost of ownership for deployments that incorporate Cisco IP phones, Cisco Aironet® wireless access points, or other standards-compliant PoE/PoE+ end devices. PoE removes the need to supply wall power to PoE-enabled devices and eliminates the cost of adding electrical cabling and circuits that would otherwise be necessary in IP phone and WLAN deployments. Table 3 shows the total PoE/PoE+ power available in each 2960-SF model.

Table 3. Switch PoE and PoE+ Power Capacity

Switch Model	PoE+ (IEEE 802.3at) Budget*	PoE (IEEE 802.3af) Budget*	Total PoE/PoE+ Budget*
Cisco Catalyst 2960S-48FPS-L	24 ports up to 30W	48 ports up to 15.4W	740W
Cisco Catalyst 2960S-48LPS-L	12 ports up to 30W	24 ports up to 15.4W or 48 ports up to 7.7W	370W
Cisco Catalyst 2960S-F24PS-L	12 ports up to 30W	24 ports up to 15.4W	370W

* Intelligent power management allows flexible power allocation across all ports.

Cisco EnergyWise

Cisco EnergyWise is an innovative architecture, added to fixed configuration switches, promoting companywide sustainability by reducing energy consumption across an entire corporate infrastructure and affecting more than 50 percent of global greenhouse gas emissions created by worldwide building infrastructure, a much greater effect than the 2 percent generated by the IT industry. Cisco EnergyWise enables companies to measure the power consumption of network infrastructure and network-attached devices and manage power consumption with specific policies, reducing power consumption to realize increased cost savings, potentially affecting any powered device.

EnergyWise encompasses a highly intelligent network-based approach to communicate messages that measure and control energy between network devices and endpoints. The network discovers Cisco EnergyWise-manageable devices, monitors their power consumption, and takes action based on business rules to reduce power consumption. EnergyWise uses a unique domain-naming system to query and summarize information from large sets of devices, making it simpler than traditional network management capabilities. Cisco EnergyWise's management interfaces allow facilities and network management applications to communicate with endpoints and each other using the network as a unifying fabric. The management interface uses standard SNMP or TCP to integrate Cisco and third-party management systems.

Cisco Catalyst SmartOperations

Cisco Catalyst SmartOperations is a comprehensive set of capabilities that simplify LAN planning, deployment, monitoring, and troubleshooting.

- **Cisco Smart Install** is a transparent plug-and-play technology to configure the Cisco IOS Software image and switch configuration without user intervention. Smart Install utilizes dynamic IP address allocation and the assistance of other switches to facilitate installation providing transparent network plug and play.
- **Cisco Auto Smartports** enables automatic configuration of switch ports as devices connect to the switch, with settings optimized for the device type.
- **Cisco Smart Troubleshooting** is an extensive array of diagnostic commands and system health checks within the switch, including Smart Call Home.

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For more information about Cisco Catalyst SmartOperations, visit http://www.cisco.com/go/smartoperations.

Ease-of-Use Features

- **Automatic QoS (AutoQoS)** simplifies QoS configuration in voice over IP (VoIP) networks by issuing interface and global switch commands to detect Cisco IP phones, classify traffic, and help enable egress queue configuration.
- **Stacking Master configuration management** and Cisco FlexStack stacking helps ensure that all switches are automatically upgraded when the master switch receives a new software version. Automatic software version checking and updating help ensure that all stack members have the same software version.
- **Dynamic Host Configuration Protocol (DHCP)** autoconfiguration of multiple switches through a boot server eases switch deployment.
- **Auto-negotiation** on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.
- **Dynamic Trunking Protocol (DTP)** facilitates dynamic trunk configuration across all switch ports.
- **Port Aggregation Protocol (PAgP)** automates the creation of Cisco Fast EtherChannel® groups or Gigabit EtherChannel groups to link to another switch, router, or server.
- **Link Aggregation Control Protocol (LACP)** allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This feature is similar to Cisco EtherChannel technology and PAgP.
- **Automatic media-dependent interface crossover (MDIX)** automatically adjusts transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed.
- **Unidirectional Link Detection Protocol (UDLD)** and Aggressive UDLD allow unidirectional links caused by incorrect fiber-optic wiring or port faults to be detected and disabled on fiber-optic interfaces.
- **Switching Database Manager (SDM)** templates for access, routing, and VLAN deployment allow the administrator to easily maximize memory allocation to the desired features based on deployment-specific requirements.
- **Local Proxy Address Resolution Protocol (ARP)** works in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.
- **Internet Group Management Protocol (IGMP)** Snooping for IPv4 and IPv6 MLD v1 and v2 Snooping provide fast client joins and leaves of multicast streams and limit bandwidth-intensive video traffic to only the requestors.
- **Multicast VLAN Registration (MVR)** continuously sends multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.
- **Per-port broadcast, multicast, and unicast storm control** prevents faulty end stations from degrading overall systems performance.
- **Voice VLAN** simplifies telephony installations by keeping voice traffic on a separate VLAN for easier administration and troubleshooting.
- **Cisco VLAN Trunking Protocol (VTP)** supports dynamic VLANs and dynamic trunk configuration across all switches.
- **Remote Switch Port Analyzer (RSPAN)** allows administrators to remotely monitor ports in a Layer 2 switch network from any other switch in the same network.

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- For enhanced traffic management, monitoring, and analysis, the Embedded **Remote Monitoring (RMON)** software agent supports four RMON groups (history, statistics, alarms, and events).
- **Layer 2 traceroute** eases troubleshooting by identifying the physical path that a packet takes from source to destination.
- **Trivial File Transfer Protocol (TFTP)** reduces the cost of administering software upgrades by downloading from a centralized location.
- **Network Time Protocol (NTP)** provides switches with accurate and consistent time of day.

Network Management

The Cisco Catalyst 2960-SF Series Switches offer a superior CLI for detailed configuration and administration. 2960-SF switches can also be managed with Cisco Network Assistant, a PC-based tool for quick configuration based on preset templates, or the Cisco Prime™ enterprise network management suite.

Cisco Network Assistant

A PC-based network management application designed for small and medium-sized business (SMB) networks with up to 250 users, Cisco Network Assistant offers centralized network management and configuration capabilities. Cisco Network Assistant uses Cisco Smartports technology to simplify both initial deployment and ongoing maintenance. This application also features an intuitive GUI where users can easily apply common services across Cisco switches, routers, and access points, such as:

- Configuration management
- Troubleshooting advice
- Inventory reports
- Event notification
- Network security settings
- Password synchronization
- Drag-and-drop Cisco IOS Software upgrades
- Secure wireless

For detailed information about Cisco Network Assistant, visit http://www.cisco.com/go/cna.

Cisco Prime Network Management

Cisco Prime network management solutions provide comprehensive network lifecycle management. Prime provides an extensive library of easy-to-use features to automate the initial and day-to-day management of your Cisco network. Cisco Prime integrates hardware and software platform expertise and operational experience into a powerful set of workflow-driven configuration, monitoring, troubleshooting, reporting, and administrative tools. Including:

- Support for new Cisco hardware platforms the day they ship
- Configuration management tools built from Cisco experience and Cisco Validated Design recommendations
- Monitoring and troubleshooting capabilities that incorporates Cisco hardware best practices and diagnostics features

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- Automation in managing hardware inventories, security vulnerabilities (PSIRTS) and platform end-of-life and support cycles

For detailed information about Cisco Prime, visit http://www.cisco.com/go/prime.

Security Features

The Cisco Catalyst 2960-SF Series Switches provide superior Layer 2 threat defense capabilities for mitigating man-in-the-middle attacks (such as MAC, IP, and ARP spoofing). TrustSec, a primary element of Borderless Security Architecture, helps enterprise customers secure their networks, data and resources with policy-based access control, identity and role-aware networking, pervasive integrity, and confidentiality. Borderless security is enabled by the following feature sets in the Cisco Catalyst 2960-SF Series Switches:

- Threat defense
- Cisco TrustSec
- Other advanced security features

Threat Defense

Cisco Integrated Security Features is an industry-leading solution available on Cisco Catalyst Switches that proactively protects your critical network infrastructure. Delivering powerful, easy-to-use tools to effectively prevent the most common and potentially damaging Layer 2 security threats, Cisco Integrated Security Features provides robust security throughout the network. Cisco Integrated Security Features include Port Security, DHCP Snooping, Dynamic ARP Inspection, and IP Source guard.

- **Port Security** secures the access to an access or trunk port based on MAC address. It limits the number of learned MAC addresses to deny MAC address flooding.
- **DHCP Snooping** prevents malicious users from spoofing a DHCP server and sending out bogus addresses. This feature is used by other primary security features to prevent a number of other attacks such as ARP poisoning.
- **Dynamic ARP Inspection (DAI)** helps ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol.
- **IP source guard** prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.

Cisco TrustSec

TrustSec secures access to the network, enforces security policies, and delivers standard based security solutions such as 802.1X enabling secure collaboration and policy compliance. TrustSec capabilities reflect Cisco thought leadership, innovations, and commitment to customer success. These new capabilities include:

- **Flexible authentication** that supports multiple authentication mechanisms including 802.1X, MAC Authentication Bypass and web authentication using a single, consistent configuration.
- **Open mode** that creates a user friendly environment for 802.1X operations.
- **Integration of device profiling technology and guest access** handling with Cisco switching to significantly improve security while reducing deployment and operational challenges.
- **RADIUS Change of Authorization and downloadable calls** for comprehensive policy management capabilities.

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- **802.1X Supplicant with Network Edge Access Transport (NEAT)** enables extended secure access where compact switches in the conference rooms have the same level of security as switches inside the locked wiring closet.

Other Advanced Security Features

Other Advanced Security features include but are not limited to:

- **Private VLAN Edge** provides security and isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.
- **Multidomain Authentication** allows an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.
- **Port-based ACLs** for Layer 2 interfaces allow security policies to be applied on individual switch ports.
- **Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3)** provide network security by encrypting administrator traffic during Telnet and SNMP sessions. SSH Protocol, Kerberos, and the cryptographic version of SNMPv3 require a special cryptographic software image because of U.S. export restrictions.
- Bidirectional data support on the **Switched Port Analyzer (SPAN)** port allows Cisco Intrusion Detection System (IDS) to take action when an intruder is detected.
- **TACACS+ and RADIUS authentication** facilitates centralized control of the switch and restricts unauthorized users from altering the configuration.
- **MAC Address Notification** allows administrators to be notified of users added to or removed from the network.
- **Multilevel security on console access** prevents unauthorized users from altering the switch configuration.
- **Bridge protocol data unit (BPDU) Guard** shuts down Spanning Tree PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops.
- **Spanning Tree Root Guard (STRG)** prevents edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
- **IGMP filtering** provides multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.
- **Dynamic VLAN assignment** is supported through implementation of VLAN Membership Policy Server client capability to provide flexibility in assigning ports to VLANs. Dynamic VLAN facilitates the fast assignment of IP addresses.

High Availability

Cisco Catalyst 2960-SF Series Switches provide Cisco FlexStack stacking to support increased resiliency and availability. Other high-availability features include:

- **Cross-Stack EtherChannel** provides the ability to configure Cisco EtherChannel technology across different members of the Cisco FlexStack for high resiliency.
- **Flexlink** provides link redundancy with convergence time less than 100 ms.

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- **IEEE 802.1s/w Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP)** provide rapid spanning-tree convergence independent of spanning-tree timers and also offer the benefit of Layer 2 load balancing and distributed processing. Stacked units behave as a single spanning-tree node.
- **Per-VLAN Rapid Spanning Tree (PVRST+)** allows rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances.
- **Switch-port autorecovery (Errdisable)** automatically attempts to reactivate a link that is disabled because of a network error.

Enhanced Quality of Service

The Cisco 2960-SF Series Switches offers intelligent services that keep everything flowing smoothly. Industry-leading mechanisms for marking, classification, and scheduling deliver superior performance for data, voice, and video traffic, all at wire speed.

QoS features supported in the Cisco 2960-SF Series Switches include:

- **Cross-stack QoS** allows QoS to be configured across the entire FlexStack stack.
- **802.1p class of service (CoS)** and differentiated services code point (DSCP) field classification are provided, using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 TCP/UDP port number.
- **Cisco control-plane and data-plane QoS ACLs** on all ports help ensure proper marking on a per-packet basis.
- **Four egress queues per port** help enable differentiated management of different traffic types across the stack.
- **Shaped Round Robin (SRR)** scheduling helps ensure differential prioritization of packet flows by intelligently servicing the ingress queues and egress queues.
- **Weighted Tail Drop (WTD)** provides congestion avoidance at the ingress and egress queues before a disruption occurs.
- **Strict priority queuing** helps ensure that the highest-priority packets are serviced ahead of all other traffic.
- **Trusted Boundary** provides the ability to trust the QoS priority settings if an IP phone is present and to disable the trust setting if the IP phone is removed, thereby preventing a malicious user.
- **Rate limiting** is provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps.
- **Up to 64 aggregate or individual policers** are available per Fast Ethernet or GbE port.

Location Awareness and Mobility

In order to provide delivery of a best-in-class network experience to end users, it's critical for network access to be location aware. A wide variety of devices can appear on the network, both wired (switches, routers, IP phones, PCs, access points, controllers, video digital media players, and so on) and wireless (mobile devices, wireless tags, rogues, and so on). In many industries, locating assets is primarily a manual process and is time consuming and error prone. The inability to locate assets in real time and to help ensure their availability when and where they are needed limits reaction time and efficiency.

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Location services answer business-critical questions about both mobile assets and the users of those assets regardless of whether those assets are connecting using wired or wireless, and hence directly improve their organization's profitability. Network Location Services also improve security and accelerate client troubleshooting by locating an asset, user, or device on the network.

- **Network visibility and control** provide centralized visibility into wired and wireless devices on the network and their location.
- **Location-assisted client troubleshooting** enables tracking of wired or wireless clients for quick problem resolution.
- **Asset tracking and improved security** provide centralized inventory of wired and wireless devices and asset management for improved business processes.
- **Location based policy** allows greater control and visibility. With EnergyWise, power policies can be set up (to reduce the power or shut down the power from a port) based on the location.
- **Cisco Emergency Responder (CER)** enhances emergency calling from Cisco Unified CallManager. It helps assure that Cisco Unified CallManager sends emergency calls to the appropriate Public Safety Answering Point (PSAP) for the caller's location.

Specifications

Tables 4 through 9 provide hardware features, power specifications, management and standards support, and safety and compliance information for the Cisco Catalyst 2960-SF Series Switches with LAN Base Software.

Table 4. Cisco Catalyst 2960-SF Series Switches Performance and Scalability

Performance and Scalability Numbers for All Switch Models			
Forwarding bandwidth	88 Gbps		
Switching bandwidth*	176 Gbps		
Flash memory	64 MB		
Memory DRAM	128 MB		
Max VLANs	255		
VLAN IDs	4000		
Maximum transmission unit (MTU)	9198 bytes		
Jumbo frames	9216 bytes		
Resource	**Default**	**QoS**	**Dual**
Unicast MAC addresses	8000	8000	8000
IPv4 IGMP groups	255	255	255
IPv4 MAC QoS access control entries (ACEs)	128	384	0
IPv4 MAC security ACEs	384	128	256

* Switching bandwidth is full-duplex capacity.

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Table 5. Dimensions, Weight, Acoustic, MTBF, and Environmental Range

Dimensions (H x W x D)				
Model	**Inches**		**Centimeters**	
Cisco Catalyst 2960S-F48FPS-L	1.75 x 17.5 x 15.2		4.5 x 44.5 x 38.6	
Cisco Catalyst 2960S-F48LPS-L				
Cisco Catalyst 2960S-F24PS-L				
Cisco Catalyst 2960S-F48TS-L	1.75 x 17.5 x 12.37		4.5 x 44.5 x 31.4	
Cisco Catalyst 2960S-F24TS-L				
Cisco Catalyst 2960S-F48TS-S				
Cisco Catalyst 2960S-F24TS-S				
Weight				
Model	**Pounds**		**Kilograms**	
Cisco Catalyst 2960S-F48FPS-L	13		5.9	
Cisco Catalyst 2960S-F48LPS-L	12.5		5.7	
Cisco Catalyst 2960S-F24PS-L	12.5		5.7	
Cisco Catalyst 2960S-F48TS-L	10.5		4.8	
Cisco Catalyst 2960S-F24TS-L	10		4.5	
Cisco Catalyst 2960S-F48TS-S	10.5		4.8	
Cisco Catalyst 2960S-F24TS-S	10		4.5	
Environmental Ranges				
Parameter	**Fahrenheit**		**Centigrade**	
Operating temperature up to 5000 ft (1500 m)	23º to 113ºF		-5º to 45ºC	
Operating temperature up to 10,000 ft (3000 m)	23º to 104ºF		-5º to 40ºC	
Storage temperature up to 15,000 feet (4573 m)	-13º to 158ºF		-25º to 70ºC	
Parameter	**Feet**		**Meters**	
Operating altitude	Up to 10,000		Up to 3000	
Storage altitude	Up to 13,000		Up to 4000	
Operating relative humidity	10% to 95% noncondensing			
Storage relative humidity	10% to 95% noncondensing			
Acoustic Noise				
Measured per ISO 7779 and declared per ISO 9296.				
Bystander positions operating mode at 25℃ ambient.				
	Sound Pressure		**Sound Power**	
Model	**LpA (Typical)**	**LpAD (Maximum)**	**LwA (Typical)**	**LwAD (Maximum)**
Cisco Catalyst 2960S-F48FPS-L	42 dB	45 dB	5.2 B	5.5 B
Cisco Catalyst 2960S-F48LPS-L				
Cisco Catalyst 2960S-F24PS-L				
Cisco Catalyst 2960S-F48TS-L	44 dB	47 dB	5.4 B	5.7 B
Cisco Catalyst 2960S-F24TS-L				
Cisco Catalyst 2960S-F48TS-S				
Cisco Catalyst 2960S-F24TS-S				

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Mean time between failures (MTBF)	
Model	**MTBF in thousands of hours (SR-332 Issue 3)**
Cisco Catalyst 2960S-F48FPS-L	260
Cisco Catalyst 2960S-F48LPS-L	318
Cisco Catalyst 2960S-F24PS-L	386
Cisco Catalyst 2960S-F48TS-L	738
Cisco Catalyst 2960S-F24TS-L	782
Cisco Catalyst 2960S-F48TS-S	738
Cisco Catalyst 2960S-F24TS-S	782
Cisco Catalyst 2960S-F-STACK	25,744

Table 6. Connectors, LED Indicators, and Dimensions

Connectors and LED Indicators
Network interfaces
• 10BASE-T ports: RJ-45 connectors, 2-pair Category 3, 4, or 5 UTP cabling • 100BASE-TX ports: RJ-45 connectors, 2-pair Category 5 UTP cabling • 1000BASE-T SFP-based ports: RJ-45 connectors, 4-pair Category 5 UTP cabling • 1000BASE-SX -LX/LH, -ZX, -BX, -T, -FX, and CWDM SFP-based ports: LC fiber connectors (single/multimode fiber) • 100BASE-LX, -BX, -FX SFP-based ports: LC fiber connectors (single/multimode fiber)
Stacking and console
Cisco Catalyst 2960-S and 2960-SF FlexStack stacking cables: • CAB-STK-E-0.5M FlexStack stacking cable with a 0.5 m length • CAB-STK-E-1M FlexStack stacking cable with a 1.0 m length • CAB-STK-E-3M FlexStack stacking cable with a 3.0 m length **Cisco Catalyst 2960-SF console cables:** • CAB-CONSOLE-RJ45 Console cable 6 ft with RJ-45 • CAB-CONSOLE-USB Console cable 6 ft with USB Type A and mini-B connectors
Power
• Use the supplied AC power cord to connect the AC power connector to an AC power outlet. • The internal power supply is an auto-ranging unit and supports input voltages between 100 and 240 VAC. • 2960-SF switches do not have a redundant-power-supply port.
Status LEDs
• Per-port status: Link integrity, disabled, activity, speed, and full duplex • System status: System, link status, link duplex, PoE, and link speed

Table 7. Management and Standards Support for Cisco Catalyst 2960-SF Series Switches with LAN Base Software

Description	Specification	
Management	• BRIDGE-MIB • CISCO-CABLE-DIAG-MIB • CISCO-CDP-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-COPY-MIB • CISCO-CONFIG-MAN-MIB • CISCO-DHCP-SNOOPING-MIB • CISCO-ENTITY-VENDORTYPE-OID-MIB • CISCO-ENVMON-MIB • CISCO-ERR-DISABLE-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-IGMP-FILTER-MIB	• CISCO-TC-MIB • CICSO-TCP-MIB • CISCO-UDLDP-MIB • CISCO-VLAN-IFTABLE • RELATIONSHIP-MIB • CISCO-VLAN-MEMBERSHIP-MIB • CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IEEE8021-PAE-MIB • IEEE8023-LAG-MIB • IF-MIB • INET-ADDRESS-MIB

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Description	Specification	
	• CISCO-IMAGE-MIB • CISCO-IP-STAT-MIB • CISCO-LAG-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-POE-EXTENSIONS-MIB • CISCO-PORT-QOS-MIB • CISCO-PORT-SECURITY-MIB • CISCO-PORT-STORM-CONTROL-MIB • CISCO-PRODUCTS-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-SMI-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB	• OLD-CISCO-CHASSIS-MIB • OLD-CISCO-FLASH-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-IP-MIB • OLD-CISCO-SYS-MIB • OLD-CISCO-TCP-MIB • OLD-CISCO-TS-MIB • RFC1213-MIB • RMON-MIB • RMON2-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB • ePM MIB • CISCO-STACKWISE-MIB
Standards	• IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.1s • IEEE 802.1w • IEEE 802.1X • IEEE 802.1ab (LLDP) • IEEE 802.3ad • IEEE 802.3af • IEEE 802.3at • IEEE 802.3ah (100BASE-X single/multimode fiber only) • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3z 1000BASE-X specification	• 100BASE-BX (SFP) • 100BASE-FX (SFP) • 100BASE-LX (SFP) • 1000BASE-BX (SFP) • 1000BASE-SX (SFP) • 1000BASE-LX/LH (SFP) • 1000BASE-ZX (SFP) • 1000BASE-CWDM SFP 1470 nm • 1000BASE-CWDM SFP 1490 nm • 1000BASE-CWDM SFP 1510 nm • 1000BASE-CWDM SFP 1530 nm • 1000BASE-CWDM SFP 1550 nm • 1000BASE-CWDM SFP 1570 nm • 1000BASE-CWDM SFP 1590 nm • 1000BASE-CWDM SFP 1610 nm • 10GBASE-LR (SFP+) • 10GBASE-SR (SFP+) • 10GBASE-LRM (SFP+) • 10GBASE-CX1 (SFP+) • RMON I and II standards • SNMP v1, v2c, and v3
RFC compliance	• RFC 768 - UDP • RFC 783 - TFTP • RFC 791 - IP • RFC 792 - ICMP • RFC 793 - TCP • RFC 826 - ARP • RFC 854 - Telnet • RFC 951 - Bootstrap Protocol (BOOTP) • RFC 959 - FTP • RFC 1112 - IP Multicast and IGMP • RFC 1157 - SNMP v1 • RFC 1166 - IP Addresses • RFC 1256 - Internet Control Message Protocol (ICMP) Router Discovery • RFC 1305 - NTP	• RFC 1901 - SNMP v2C • RFC 1902-1907 - SNMP v2 • RFC 1981 - Maximum Transmission Unit (MTU) Path Discovery IPv6 • FRC 2068 - HTTP • RFC 2131 - DHCP • RFC 2138 - RADIUS • RFC 2233 - IF MIB v3 • RFC 2373 - IPv6 Aggregatable Addrs • RFC 2460 - IPv6 • RFC 2461 - IPv6 Neighbor Discovery • RFC 2462 - IPv6 Autoconfiguration • RFC 2463 - ICMP IPv6 • RFC 2474 - Differentiated Services (DiffServ) Precedence • RFC 2597 - Assured Forwarding

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Description	Specification	
	• RFC 1492 - TACACS+ • RFC 1493 - Bridge MIB • RFC 1542 - BOOTP extensions • RFC 1643 - Ethernet Interface MIB • RFC 1757 - RMON	• RFC 2598 - Expedited Forwarding • RFC 2571 - SNMP Management • RFC 3046 - DHCP Relay Agent Information Option • RFC 3376 - IGMP v3 • RFC 3580 - 802.1X RADIUS

Table 8. Voltage and Power Information

AC/DC input voltage and current			
Cisco Catalyst 2960-S	**Voltage (Autoranging)**	**Current**	**Frequency**
Cisco Catalyst 2960S-F48FPS-L	100 to 240 VAC	9 to 4 A	50 to 60Hz
Cisco Catalyst 2960S-F48LPS-L		9 to 4 A	
Cisco Catalyst 2960S-F24PS-L		5 to 2 A	
Cisco Catalyst 2960S-F48TS-L		5 to 2 A	
Cisco Catalyst 2960S-F24TS-L		1 to 0.5 A	
Cisco Catalyst 2960S-F48TS-S		5 to 2 A	
Cisco Catalyst 2960S-F24TS-S		1 to 0.5 A	
Power Rating			
Model		**Power Rating**	
Cisco Catalyst 2960S-F48FPS-L		0.89 kVA	
Cisco Catalyst 2960S-F48LPS-L		0.48 kVA	
Cisco Catalyst 2960S-F24PS-L		0.46 kVA	
Cisco Catalyst 2960S-F48TS-L		0.13 kVA	
Cisco Catalyst 2960S-F24TS-L		0.09 kVA	
Cisco Catalyst 2960S-F48TS-S		0.10 kVA	
Cisco Catalyst 2960S-F24TS-S		0.08 kVA	
PoE and PoE+			
• Maximum power supplied per port for PoE+ is 30W. • Maximum power supplied per port for PoE is 15.4W. • Total power dedicated to PoE or PoE+ is 370W or 740W.			

Table 9 shows power consumption of Cisco Catalyst 2960-SF Series Switches based on Alliance for Telecommunications Industry Solutions (ATIS) testing using IMIX distribution stream traffic, with input voltage of 115V AC @ 60 Hz and no PoE loading.

Table 9. Power Consumption for Cisco Catalyst 2960-SF Series Switches

Model	Power Consumption (W)			
Model	**0% Traffic**	**10% Traffic**	**100% Traffic**	**Weighted Average**
Cisco Catalyst 2960S-F48FPS-L	62	61	61	61
Cisco Catalyst 2960S-F48LPS-L	55	54	54	54
Cisco Catalyst 2960S-F24PS-L	48	47	47	47
Cisco Catalyst 2960S-F48TS-L	35	35	35	35
Cisco Catalyst 2960S-F24TS-L	27	27	27	27
Cisco Catalyst 2960S-F48TS-S	36	35	35	35
Cisco Catalyst 2960S-F24TS-S	27	27	27	27

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Regulatory Compliance and Safety

Table 10. Safety and Compliance

Description	Specification
Safety certifications	• UL 60950-1, Second Edition • CAN/CSA 22.2 No. 60950-1, Second Edition • TUV/GS to EN 60950-1, Second Edition • CB to IEC 60950-1 Second Edition with all country deviations • CE Marking • NOM (through partners and distributors)
Electromagnetic emissions certifications	• FCC Part 15 Class A • EN 55022 Class A (CISPR22) • EN 55024 (CISPR24) • AS/NZS CISPR22 Class A • CE • MIC
Environmental	Reduction of Hazardous Substances (ROHS)
Telco	Common Language Equipment Identifier (CLEI) code
Warranty	Limited lifetime warranty

Cisco Enhanced Limited Lifetime Hardware Warranty

Cisco Catalyst 2960-SF Series Switches come with an enhanced limited lifetime warranty (Table 11). The warranty for the Cisco Catalyst 2960-SF has the same terms as our standard limited lifetime warranty plus the addition of next business day delivery of replacement hardware where available and 90 days of 8X5 Cisco Technical Assistance Center (TAC) support.

Your formal warranty statement, including the warranty applicable to Cisco software, appears in the Cisco information packet that accompanies your Cisco product. We encourage you to review carefully the warranty statement shipped with your specific product before use.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

For further information on warranty terms, visit http://www.cisco.com/go/warranty.

Table 11. Enhanced Limited Lifetime Warranty Terms

	Cisco Enhanced Limited Lifetime Hardware Warranty
Device covered	Applies to Cisco Catalyst 2960-SF Series Switches.
Warranty duration	As long as the original end user continues to own or use the product, provided that: fan and power supply warranty is limited to five (5) years.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to five (5) years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a Cisco Catalyst 2960-SF replacement part for next business day delivery, where available. Otherwise, a replacement will be shipped within ten (10) working days after the receipt of the RMA request. Actual delivery times may vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than ninety [90] days after original shipment by Cisco).
TAC support	Cisco will provide during customer's local business hours, 8 hours per day, 5 days per week basic configuration, diagnosis, and troubleshooting of device-level problems for up to 90 days from the date of shipment of the originally purchased Cisco Catalyst 2960-SF product. This support does not include solution or network-level support beyond the specific device under consideration.
Cisco.com Access	Warranty allows guest access only to Cisco.com

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Software Update Policy for Cisco Catalyst 2960-SF Series Switches

Customers with Cisco Catalyst LAN Base software licenses will be provided with maintenance updates and bug fixes designed to maintain the compliance of the software with published specifications, release notes, and industry standards as long as the original end user continues to own or use the product or up to one year from the end-of-sale date for this product, whichever occurs earlier.

This policy supersedes any previous warranty or software statement and is subject to change without notice.

Cisco and Partner Services for the Cisco Catalyst 2960-SF

Minimize operating costs and reduce power consumption with the Cisco Catalyst 2960-SF using intelligent, personalized services from Cisco and our partners. Through a discovery process that begins with understanding your business objectives, we help you integrate the Cisco Catalyst into your architecture and incorporate network services onto it. Sharing knowledge and leading practices, we support your success every step of the way as you deploy, absorb, manage, and scale new technology. Choose from a flexible suite of support services designed to meet your business needs and help you maintain high-quality network performance while controlling operational costs. Table 12 lists the technical services available for the Cisco Catalyst 2960-SF Series Switches.

Table 12. Technical Services Available for Cisco Catalyst 2960-SF Series Switches

Technical Services
Cisco SMARTnet Service • Around-the-clock, global access to the Cisco TAC • Unrestricted access to the extensive Cisco.com knowledge base and tools • Next-business-day, 8x5x4, 24x7x4, or 24x7x2 advance hardware replacement and onsite parts replacement and installation available[1] • Ongoing operating system software updates within the licensed feature set[2] • Proactive diagnostics and real-time alerts on Smart Call Home enabled devices
Cisco Smart Foundation Service • Next-business-day advance hardware replacement as available • Access to SMB TAC during business hours (access levels vary by region) • Access to Cisco.com SMB knowledge base • Online technical resources through Smart Foundation Portal • Operating system software bug fixes and patches
Cisco Smart Care Service • Network-level coverage for the needs of small and medium-sized businesses • Proactive health checks and periodic assessments of Cisco network foundation, voice, and security technologies • Technical support for eligible Cisco hardware and software through Smart Care Portal • Cisco operating system and application software updates and upgrades[2] • Next-business-day advance hardware replacement as available, 24x7x4 option available[1]
Cisco SP Base Service • Around-the-clock, global access to the Cisco TAC • Registered access to Cisco.com • Next-business-day, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement. Return to factory option available[1] • Ongoing operating system software updates[2]

[1] Advance hardware replacement is available in various service-level combinations. For example, 8x5xNBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with next-business-day (NBD) delivery. Where NBD is not available, same day shipping is provided. Restrictions apply; review the appropriate service descriptions for details.
[2] Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

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Technical Services
Cisco Focused Technical Support Services Three levels of premium, high-touch services are available: • Cisco High-Touch Operations Management Service • Cisco High-Touch Technical Support Service • Cisco High-Touch Engineering Service Valid Cisco SMARTnet or SP Base contracts are required on all network equipment.

Ordering Information

Tables 13 and 14 give ordering information for the Cisco Catalyst 2960-SF Series Switches

Table 13. Ordering Information for Cisco Catalyst 2960-SF Series Switches

Part Numbers	Description
WS-C2960S-F48FPS-L	48 10/100 Fast Ethernet ports, 740W of POE/POE+ power, 4xSFP, FlexStack stacking (requires module), LAN Base software
WS-C2960S-F48LPS-L	48 10/100 Fast Ethernet ports, 370W of POE/POE+ power, 4xSFP, FlexStack stacking (requires module), LAN Base software
WS-C2960S-F24PS-L	24 10/100 Fast Ethernet ports, 370W of POE/POE+ power, 2xSFP, FlexStack stacking (requires module), LAN Base software
WS-C2960S-F48TS-L	48 10/100 Fast Ethernet ports, 4xSFP, FlexStack stacking (requires module), LAN Base software
WS-C2960S-F24PS-L	24 10/100 Fast Ethernet ports, 2xSFP, FlexStack stacking (requires module), LAN Base software
WS-C2960S-F48TS-S	48 10/100 Fast Ethernet ports, 2xSFP, LAN Lite software
WS-C2960S-F24TS-S	24 10/100 Fast Ethernet ports, 2xSFP, LAN Lite software

Table 14. Ordering Information for Cisco Catalyst 2960-SF Accessories

Part Numbers	Description
C2960S-F-STACK	FlexStack hot-swappable stacking module: compatible with Cisco Catalyst 2960-SF Series LAN Base switches only.
CAB-STK-E-0.5M	FlexStack stacking cable with a 0.5 m length
CAB-STK-E-1M	FlexStack stacking cable with a 1.0 m length
CAB-STK-E-3M	FlexStack stacking cable with a 3.0 m length
CAB-CONSOLE-RJ45	Console cable 6 ft with RJ45
CAB-CONSOLE-USB	Console cable 6 ft with USB Type A and mini-B connectors
RCKMNT-1RU=	Spare rack-mount kit for 19- and 24-inch racks
RCKMNT-REC-1RU=	1 RU recessed rack-mount kit

For the latest SFP compatibility information with C2960-SF model switches, consult the tables available here: http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html.

For more information about Cisco products, contact:

- United States and Canada: (toll free) 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- Internet: http://www.cisco.com

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